

What is claimed is:

1. An umbilical cable for delivering electrical signals between an aircraft and a smart weapon carried by the aircraft, the umbilical cable comprising:
5 cabling comprising a plurality of conductive wires;
 a first connector provided on one end of the cabling and configured to connect to the aircraft;
 a second connector provided on the other end of the cabling and configured to connect to the smart weapon; and
10 an interface circuit electrically coupled between the first connector and the second connector via the plurality of conductive wires, the interface circuit being configured to receive via the first connector a non-standard combination of signals comprising at least one of data signals, control signals and power signals not
15 receivable directly by the smart weapon to carry out operations, to convert the non-standard combination of signals to a set of signals receivable by the smart weapon to carry out operations, and to provide the set of receivable signals to the smart weapon via the second connector.
2. The umbilical cable of claim 1, wherein the non-standard
20 combination comprises discrete signals from the aircraft.
3. The umbilical cable of claim 1, wherein the interface circuit
 comprises a memory for storing a sequence of control commands for operating the smart weapon, and a bus controller for providing the sequence of control
25 commands to the smart weapon.
4. A system comprising the umbilical cable of claim 1, and further comprising:
 source operation circuitry for providing the non-standard combination of
30 signals to the first connector.
5. The system of claim 4, wherein the aircraft comprises an aircraft connector designed to mate with the first connector, and the source operation

circuitry comprises at least one hardwired connection of a discrete control signal from elsewhere in the aircraft to the aircraft connector.

5 6. The system of claim 5, wherein the discrete control signal comprises at least one of a release signal representing a desired release of the smart weapon, and a master arm signal representing a desire to arm the smart weapon.

10 7. The system of claim 5, wherein the source operation circuitry further comprises a communication bus which is coupled to a corresponding bus included within the umbilical cable.

 8. The system of claim 7, wherein the communication bus is a two wire bus.

15 9. The system of claim 4, wherein the source operation circuitry comprises a pilot-operated digital processor.

20 10. The system of claim 9, wherein the pilot-operated digital processor is portable.

 11. The system of claim 10, wherein the pilot-operated digital processor is hardwired to an aircraft connector designed to mate with the first connector.

25 12. The system of claim 10, wherein the pilot-operated digital processor is wirelessly linked to an aircraft connector designed to mate with the first connector.

30 13. A system comprising the umbilical cable of claim 1, and further comprising a ground loading device configured to connect to at least one of the first connector and the second connector to program operation data for the smart weapon into the umbilical cable.

14. The system of claim 13, wherein the ground loading device programs target coordinate data into the umbilical cable 18.

5 15. The system of claim 13, wherein the umbilical cable further includes a display for displaying at least a portion of the operation data programmed into the umbilical cable.

10 16. The system of claim 13, wherein the display is included in a backshell of at least one of the first connector and the second connector.

17. A method of providing operation data to a smart weapon configured to be loaded on an aircraft, the method comprising the steps of:
providing an umbilical cable, the umbilical cable comprising:
cabling comprising a plurality of conductive wires;
15 a first connector provided on one end of the cabling and configured to connect to the aircraft;
a second connector provided on the other end of the cabling and configured to connect to the smart weapon; and
an interface circuit electrically coupled between the first connector
20 and the second connector via the plurality of conductive wires, the interface circuit being configured to receive via the first connector a combination of signals comprising at least one of data signals, control signals and power signals not receivable directly by the smart weapon to carry out operations, to convert the combination of signals to a set of signals receivable by the smart weapon to carry
25 out operations, and to provide the set of receivable signals to the smart weapon via the second connector;
temporarily connecting at least one of the first connector and the second connector to a ground loading device; and
transmitting the operation data from the ground loading device to the
30 umbilical cable and storing the operation data within the umbilical cable.

18. The method of claim 17, further comprising the steps of connecting the first connector to the aircraft, connecting the second connector to the smart

weapon, and providing the operation data stored within the umbilical cable to the smart weapon during operation of the aircraft.

5 19. The method of claim 17, wherein the method is carried out while the umbilical cable is connected at one end to the aircraft.

 20. The method of claim 17, wherein the ground loading device provides target coordinate data to the umbilical cable.

10 21. The method of claim 17, wherein the umbilical cable further includes a display and displays at least a portion of the operation data stored in the umbilical cable.

15 22. The method of claim 17, wherein the display is included in a backshell of at least one of the first connector and the second connector.

 23. The method of claim 17, wherein the umbilical cable supports bi-directional communication between the smart weapon and the ground loading device.

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